We claim:

1. A nanotextured biocompatible composite, comprising a biocompatible substrate, a calcium phosphate component on such said substrate; and a nanotextured mineral phase on said calcium phosphate component, said mineral phase comprising calcium phosphate and poly(L-lysine).

2. The composite of claim 1 wherein the calcium content of said mineral phase is less than stoichiometric, and said poly(L-lysine) is incorporated within said·calcium phosphate.

3. The composite of claim 1 wherein said mineral phase is reactive with at least one of an acid and degradative enzyme.

4. The composite of claim 1 further comprising nanofibers of peptide amphiphiles coupled to said poly(L-lysine), at least one of said peptide amphiphiles comprising a carboxy functionality.

5. The composite of claim 4 wherein at least one of said peptide amphiphiles comprises an RGD sequence.

6. The composite of claim 4 further comprising a mammalian preosteoblast cell culture.

7. The composite of claim 1 wherein said substrate comprises titanium.

8. A method of promoting growth of an amine-modified calcium phosphate composition, said method comprising:

providing a biocompatible substrate;

depositing a substantially single-phase calcium phosphate component on said substrate; and

introducing said substrate to a calcium phosphate medium, said medium comprising a poly(L-lysine) component.

9. The method of claim 7 wherein said substrate contacts a medium comprising a reactive calcium reagent and a reactive phosphate reagent, said contact for a time sufficient to deposit said calcium phosphate component on said substrate.

10. The method of claim 8 wherein said calcium phosphate medium comprises at least one of a reactive calcium reagent and a reactive phosphate reagent.

11. The method of claim 10 wherein at least one of said reagents comprises said poly(L-lysine) component.

12. The method of claim 8 wherein said deposition comprises formation of crystalline calcium phosphate, and said introduction incorporates poly(L-lysine) into a calcium phosphate phase.

13. The method of claim 12 wherein said introduction induces a nanotextured component comprising calcium phosphate and poly(L-lysine).

14. A method of coupling peptide amphiphiles to a biocompatible substrate, said method comprising:

providing a biocompatible substrate;

depositing a substantially single-phase calcium phosphate component on said substrate;

depositing a mineral phase on said calcium phosphate phase, said mineral phase comprising calcium phosphate and poly(L-lysine) incorporated therein; and

contacting said poly(L-lysine) with peptide amphiphiles, at least one of said amphiphiles comprising a carboxy functionality.

15. The method of claim 14 wherein said peptide amphiphiles comprise a nanofiber assembly.

16. The method of claim 14 wherein said substrate contacts a medium comprising a reactive calcium reagent and a reactive phosphate reagent, said contact for a time sufficient to deposit said calcium phosphate component on said substrate.

17. The method of claim 14 wherein said mineral phase is the reaction product of a calcium reagent and a phosphate reagent, and introduction of poly(L-lysine) during said reaction.

18. The method of claim 14 further comprising contacting said mineral phase with at least one of an acid and a degradative enzyme.

19. The method of claim 14 wherein at least one of said peptide amphiphiles comprises an RGD sequence.

20. The method of claim 14 further comprising, culturing mammalian cells on said peptide amphiphiles.